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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,079	09/12/2003	Yigal Levi	35643.0005	9798

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EXAMINER

GREENE, DANIEL LAWSON

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 01/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,079

Applicant(s)

LEVI, YIGAL

Examiner

Daniel L. Greene Jr.

Art Unit

3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/25/04 and 9/12/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/26/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. A signed and dated IDS is attached to the instant office action.

Drawings

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because:

A. Figure 3, of both drawings received 9/12/03 and 2/252/04, is illegible in its content and the examiner can discern no applicable information,

B. by applicant's admission on page 8 of the disclosure, Fig 4A appears to be disclosing prior art, or as applicant states a conventional blasting arrangement, but is not labeled as such,

C. of those reasons listed on the attached PTO-948. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because of the term "onion-like" in the second line. The art recognized terminology is cavity, spring, cavern, enlargement, etc, however "onion shaped" will suffice. Appropriate correction is required. See MPEP § 608.01(b).
4. The disclosure is objected to because of the following informalities:

A. After amendment of drawings dated 02/25/2004, page 8, Brief Description of the Drawings lacks notation and description of Figures 2A, 2B, 4A and 4B.

B. Figure 3 is illegible and void of any useful content.

C. Page 11 describes Figure 3 however the quality of figure 3 is so poor that no discernable information exists.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 5, 8, 10, 13-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

With regard to Claims 5 and 13, the disclosure fails to explain:

A. how and in what manner the initial stemming characteristics and/or amount of initial explosive charge are utilized ^{/determined} for obtaining wanted general shape and dimensions of the onion, according to known geological and topographical characteristics, and

B. how and in what manner the geological and topographical characteristics of the site to be blasted determine the shape and dimensions of the onion.

Claims 8 and 15 are rejected due to their dependency on claim 5.

With regard to claims 10, 14 and 15 the disclosure fails to explain how and in what manner the "Bench Height" determines:

- A. the array of drill holes, and
- B. the depth of said drill holes, and
- C. the dimensions and shape of the "onions".

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1, 2, 4, 11, 16, and 17, the phrase "onion-like" renders the claims indefinite because the claims include elements not actually disclosed (those encompassed by "onion-like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Regarding claims 11, 16 and 17, the phrase " $0.5 < n < 0.9$ " renders the claims indefinite because the claims include elements not actually disclosed (those encompassed by the term "n"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d). Examiner suggests amending claims to include the full definition of the term "n".

Claims 3, 5-10, and 12-15 are rejected due to their respective dependency on rejected claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 7, 10-12, 14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 2,745,346 to Aitchison et al.

Aitchison clearly discloses a blasting method, comprising using an array of onion-shaped drill holes having a cylindrical upper portion and an onion-like lowermost portion, which blasting method comprises,

(a) Drilling an array of cylindrical drill holes in a site that is to be blasted;

(b) For each of the cylindrical drill holes, performing the steps of:

b.1) Imparting an onion shape to the bottom portion of the drill hole;

b.2) Filling the onion with a primary explosive charge;

b.3) Filling a first portion of the drill hole, above said primary explosive charge, with buffer material;

b.4) Filling a second portion of the drill hole, above said buffer material, with a secondary explosive charge;

b.5) Filling a third portion of the drill hole with additional buffer material;
and

(c) Detonating said primary and secondary explosive charges, in Figure 3, column 1 lines 12-20, 62-65, column 2 lines 70+, column 3 lines 1-30 and column 4 lines 23-55.

Claim 2 is inherently disclosed in column 2 lines 70+ and column 3 lines 1-5 wherein is understood that springing or chambering is old and well known in the art to contain the methods presented by applicant.

Claims 7 and 12 are inherently disclosed in Figure 3 and column 3 lines 1-30, wherein it is understood that the dimensions of the first, second and third portions would be approximately those disclosed by applicant by proportion of total drill hole depth.

Claims 10 and 14 are inherently disclosed wherein it is understood that the "Bench Height", or desired blasting area of the site must be known and analyzed in order to even begin to determine the array of drill holes, depth of said drill holes, the dimensions (amount of explosives) and shape of the caverns/onions/springs/cavities considered.

Claims 11 and 16 are disclosed in Figure 3 wherein it is understood that the diameter of the cavity appears slightly less than the height and therefore fulfills applicant condition. For example, using a ruler and measuring Fig 3 provides a diameter of .4375 inches and a height of .5 inches. Dividing .4375 by .5 yields .875, which is within the limits of the conditions claimed.

8. Claim 1, 2, 4, 10, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 3,714,895 to Rawson.

Rawson clearly discloses a blasting method, comprising using an array of onion-shaped drill holes having a cylindrical upper portion and an onion-like lowermost portion, which blasting method comprises,

(a) Drilling an array of cylindrical drill holes ((1)-(13)) in a site that is to be blasted;

(b) For each of the cylindrical drill holes ((1)-(13)), performing the steps of:

- b.1) Imparting an onion shape (22) to the bottom portion of the drill hole;
- b.2) Filling the onion with a primary explosive charge (11);
- b.3) Filling a first portion of the drill hole, above said primary explosive charge, with buffer material (14);
- b.4) Filling a second portion of the drill hole, above said buffer material, with a secondary explosive charge (15);
- b.5) Filling a third portion of the drill hole with additional buffer material; and (16)

(c) Detonating said primary and secondary explosive charges, in Figures 1, 3-5, and 7 and column 2 lines 48-62, column 4 lines 13-28, column 5 lines 29-45, column 6 lines 16-29 and 37-56, column 8 lines 8-29, column 9 lines 26-29 and column 10 lines 7-21.

Rawson discloses claim 2 in column 6 lines 37-56.

Rawson inherently discloses claim 4 in column 4 lines 26-27 wherein it is understood that "suitable plugs" are well known in the art to include the utilization of

initial stemming because "any suitable technique may be utilized" and "hole springing techniques are well known in the art".

Rawson discloses claims 10, 13 and 14 in column 5 lines 29-44.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-8, 10-12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,745,346 to Aitchison et al in view of U.S. Patent 3,710,718 to Grant.

With regard to claims 1, 7, 10-12, 14 and 16, Aitchison discloses applicant invention as explained in detail above.

With regard to claim 2, Aitchison does not expressly disclose the method of imparting the onion shape to the bottom portion of a drill hole is performed by:

- (a) Filling the bottom portion of a cylindrical drill hole with initial explosive charge, which initial charge is relatively small with respect to the primary explosive charge, but is large enough to impart to the bottom of the drill hole the onion shape; and
- (b) Detonating the initial explosive charge.

Grant discloses a method for creating underground cavities employing explosives wherein imparting the onion shape (known in the art as springing) to the bottom portion of a drill hole is performed by:

- (a) Filling the bottom portion of a cylindrical drill hole (11) with initial explosive (12) charge large enough to impart to the bottom of the drill hole the onion shape; and (b) Detonating the initial explosive charge in Figures 1, 2 and column 4 lines 4-23.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to utilize the method of Grant to spring the bottom portion of the drill hole of Aitchison in order to gain the advantages therefrom (i.e. creating a cavity within the earth without disturbing the surface; rapidly creating cavities within the earth for cratering programs, etc.,) as such results are in no more than the use of conventionally old and well known techniques, methods and procedures available within the art.

With regard to claim 3, Aitchison in view of Grant discloses applicants invention as explained above, however Aitchison in view of Grant does not expressly disclose that the bottom portion of the cylindrical drill hole, which is filled with the initial explosive charge, is preferably between 3% and 5% of the total depth of the cylindrical drill hole.

Grant, column 1 lines 35+ and column 2 lines 1-45 discloses formula to determine critical depths of certain explosives. It would have been obvious to one having ordinary skill the art at the time the invention was made to vary the amount of the explosives charged into the borehole in order to achieve an optimum result in creating

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the desired cavity (onion) size, In re Aller, 105 USPQ (CCPA 1955) and In re Reese, 129 USPQ 402 (CCPA 1961)

Grant further discloses claim 4 in column 4 lines 19-23 wherein it is understood that drill cutting is "initial stemming".

Grant discloses claim 5 in the rejection of corresponding parts above as well as column 3 lines 35-45.

Grant further discloses claim 6 in column 3 lines 41-42, column 4 lines 6-9 wherein it is understood that "80% - 90% of the "Bench Height" is incorporated within the wording of "approximate depth of the desired cavity" and "about the lower portion of the desired depth of the cavity" (underlining added) If applicant is of the opinion this wording does not incorporate the range desired, it would have been obvious to vary the depth of the holes drilled in order to achieve an optimum result of creating cavities in desired locations, In re Aller, 105 USPQ (CCPA 1955) and In re Reese, 129 USPQ 402 (CCPA 1961).

With regard to claim 8, Grant discloses in column 5 lines 33-38 that the diameter of the chamber (onion/spring/cavity) generated when explosives are detonated is equal to approximately 4 times the diameter of the charge. Therefore if the diameter of the drill hole and subsequent charge is 8 inches, 8 times 4 equals 32 inches, which is approximately 1 meter. Aitchison discloses that the chamber is filled with primary explosive in column 3 lines 44-49. As taught by Grant, some amount of experimentation is required in order achieve an optimum result, therefore to it would have been obvious to vary the length, diameter and loading of the "onion" in order to

achieve an optimum result, In re Aller, 105 USPQ (CCPA 1955) and In re Reese, 129 USPQ 402 (CCPA 1961).

10. Claims 1-8, 10-12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aitchison et al. as modified by Grant above and further in view of U.S. Patent 6,520,089 to Avanci et al.

Aitchison as modified by Grant discloses claims 1- 6, 10-12, 14 and 16 of applicant's invention as explained above.

With regard to claim 7, Grant discloses that the diameter of the cylindrical portions are approximately 8 inches in column 5 line 27 and the depth of the drill hole is approximately 13 meters in column 5 line 29. Aitchison discloses in Figure 3 the approximate values of portions disclosed by applicant, however Aitchison as modified by Grant discloses the approximate proportions of the portions in regard to the total overall length, they do not expressly disclose the lengths of the first, second and third portions of the drill hole are approximately 7.8m, 1.95m and 1.95m, respectively.

Avanci discloses in column 4 lines 49-52 that the length of the shot hole is determined by the desired depth of the explosion center and as a rule amounts to between 10m and 30m.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide drill holes with the lengths and proportions of the portions claimed by applicant in order to gain the advantages therefrom (i.e. deck loading, realizing the full efficiency of the explosive, placing explosives in rock strata where it will be most advantageous, etc.,) as such results are in no more than the use of

conventionally old and well known techniques, methods and procedures available within the art and it would have been obvious to vary the characteristics of the holes drilled in order to achieve an optimum result, In re Aller, 105 USPQ (CCPA 1955) and In re Reese, 129 USPQ 402 (CCPA 1961).

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aitchison et al. as modified by Grant above and further in view of applicants own admission of prior art.

Aitchison as modified by Grant discloses applicants invention as explained above, however they do not expressly disclose that the array of drill holes comprises essentially parallel rows of drill holes; the spacing between each two adjacent drill holes in the same row being approximately 18 meters, and the spacing between each two adjacent rows being approximately 16 meters.

Applicant discloses prior art in Figure 4A and page 1 wherein it is stated, "Different geometrical arrangements, or arrays, of conventional drill holes are commonly used, which arrangements depend on the geological and topographical characteristics of the site that is to be blasted and on the desired blasting results."

Therefore, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to vary the distance and spacing of the drill holes to those claimed by applicant in order to gain the advantages therefrom (i.e. realizing the full efficiency of the explosive, placing explosives in rock strata where it will be most advantageous, minimizing the amount of explosives used, etc.,) as such results are in no more than the use of conventionally old and well known techniques, methods and

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procedures available within the art, additionally it would also have been obvious to vary the spacing characteristics of the holes drilled in order to achieve an optimum result, In re Aller, 105 USPQ (CCPA 1955) and In re Reese, 129 USPQ 402 (CCPA 1961).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as showing the current state of the art.

British Patent 19,045 from 1897 and the Explosives and Demolitions Engineer Field Manual from 1942, show it is notoriously old and well known to provide drill holes with a cavity at the end filled with explosives and methods of making those cavities respectfully.

13. Examiner's Note: Examiner has cited particular columns and line numbers in the references as applied to the claims for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L Greene Jr. whose telephone number is (703) 605-1210. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael J Carone can be reached on (703) 306-4198. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DIG
January 12, 2005


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